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CONTENTS

A Technique for Determining Levels of Group Reading ... 113
JAMES E. WERT, *Bureau of Educational Research*

Illustrative Test Exercises in High-School Chemistry ... 122
F. P. FRUTCHEY, *Bureau of Educational Research*

Certain Attitudes of High-School and College Students ... 127
PAUL R. GRIM, *Bureau of Educational Research*

Editorial Comments ... 134

Readings ... 137

BOOKS TO READ: *A Student's History of Education: Our Education Today in the Light of Its Development; Elements of Psychology; A Humane Psychology of Education; Principles and Techniques of Curriculum Making; Secondary School Teaching; Abstracts, Graduate Theses in Education, Teachers College, University of Cincinnati, 1931–1936, Vol. II.*

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Educational Research Bulletin

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A Technique for Determining Levels of Group Reading

By JAMES E. WERT

It is frequently necessary to evaluate reading which is done by particular groups of individuals. English teachers, for example, are concerned with the optional reading which students do when they are removed from classroom pressure. Prevailing practice in evaluating group reading begins with collecting evidence concerning the specific books, magazines, and newspapers read, together with the time which students say they spend in reading. From these data, evaluations of two different aspects of reading are needed: the quantity of reading and the quality of reading. The evaluation of the quantity of reading is a more or less simple procedure. It is not difficult to list the number of books, the number of magazines, or the number of newspapers which students say they read, nor is it difficult to evaluate the time which students say they spend in reading; but the more significant aspect—the quality of reading—is more perplexing.

It is not difficult for an English teacher to compare, in a rough fashion, the books which are read and thus to arrive at a crude evaluation of quality. Likewise, there is mutual agreement that a student who reads *Harper's*, *Scribner's*, and *Fortune* is reading a higher quality of material than the student who reads *Liberty*, *True Story*, and *Photoplay*. Subjective estimate, however, is much too crude to compare two students, one of whom reads *Saturday Evening Post*, *Cosmopolitan*, and *Harper's*, while the other reads *Collier's*, *Scribner's*, and *Redbook*. Obviously, some technique for evaluating the quality of reading is needed which will differentiate with greater precision than the subjective judgments of competent authorities, regardless of how competent those authorities may be.

A pioneer attempt to evaluate levels of reading material

was attempted by Dale and Tyler.[1] They experimented with groups of low reading ability and attempted to find the difficulty of reading material by means of its structural aspects. The three structural aspects which they used were the number of different technical words in the selection, the number of different hard nontechnical words, and number of indeterminate clauses. Their study leaves little doubt but that, to some extent, the difficulty of reading material can be predicted from its structural nature, so long as the materials are limited to those which are read by groups of lower reading ability. These investigators do not infer that difficulty and quality of reading material are synonymous.

THE urgent demand for measures of quality, however, has induced a number of investigators, tentatively at least, to accept these measures of difficulty as constituting measures of quality. Furthermore, the need for measures of quality of higher-grade reading material has caused investigators to infer that the techniques for determining difficulty in lower-grade reading could be extrapolated into material which appeals to individuals of higher reading ability.

More recently Gray and Leary have utilized the techniques developed by Dale and Tyler and have extended their use by including many more items of structural content; and, after validating their techniques in the light of individuals of low reading ability, they have assumed that the techniques are applicable throughout the range of reading material.[2] For example, they have found that difficulty of magazines could be estimated quite accurately by using four structural characteristics of the material: the median sentence length, the percentage of monosyllabic words, the percentage of simple sentences, the percentage of different words.[3] As a result of their technique, employing a regression equation, magazines have been classified into three groups according to difficulty as shown in Table I.

So long as magazines are classified as crudely as they have been here, probably little complaint can be made of the classification. It should be noted, however, that no validation is

[1] Dale, Edgar, and Tyler, Ralph W. "A Study of the Factors Influencing the Difficulty of Reading Materials for Adults of Limited Reading Ability," *Library Quarterly*, IV (July, 1934), pp. 384–412.

[2] Gray, William S., and Leary, Bernice E. *What Makes a Book Readable*. Chicago: University of Chicago Press, 1935.

[3] Gray *et al.*, pp. 143–93.

reported of the difficulty of these magazines except in the light of groups of lower reading ability, which quite obviously may or may not hold true with magazines of the type of *Atlantic*, *Harper's*, and *Scribner's*. If the regression equation for prediction of magazine reading difficulty should be reconstructed, further differentiation of the magazines may be made.[4] When this is done, it is found that the *Pathfinder* is a more difficult magazine to read than the *Atlantic Monthly*. Quite obviously, this is contrary to actual fact. It is common knowledge that the

TABLE I

RELATIVE DIFFICULTY OF GENERAL MAGAZINES BY COMPOSITE CLASSIFICATION ON THE BASIS OF THE FOUR ELEMENTS OF DIFFICULTY*

EASY	AVERAGE	DIFFICULT
(1)	(2)	(3)
Aces	American	Atlantic Monthly
All-Story	American Home	Literary Digest
Dream World	Better Homes and Gardens	Pathfinder
Clues	Collier's	Radio News
Gentlewoman	McCall's	Review of Reviews
True Romances	Mother's Home Life	
	Capper's Farmer	
	Sky Riders	
	Picture Play	
	New Movie	
	Liberty	
	Motion Picture Classic	
	Cosmopolitan	
	Saturday Evening Post	
	Outdoor Life	
	House and Garden	
	World's Work	

* Gray *et al.*, *op. cit.*, p. 176.

Pathfinder is quite readable and understandable to pupils in the lower levels of secondary schools, while the *Atlantic Monthly* is much more difficult for them to comprehend.

For some reason, this Gray-Leary study did not include the *Reader's Digest*. Attempts made in this investigation to apply their techniques to the *Reader's Digest* tend to place it as much more difficult than any of the magazines which they have considered. This placement seems contrary to common observation of the reading levels in schools where the *Reader's Digest* can be read with interest and understanding by school pupils even of the lower secondary level.

[4] This regression equation has been omitted from the Gray-Leary book; equations are given utilizing other variables than those suggested as most valuable for magazines.

Actually, the difficulty of reading material probably depends upon characteristics other than those of a structural nature. "Difficulty of the content" is apparently another factor which determines the level at which various types of reading material can be utilized with profit. In view of the need for measures of "quality" together with the seeming inadequacy of using "difficulty" as determined by Gray and Leary as a quality index, it seems desirable to attempt to approach the quality of reading from some other standpoint.

THE assumption has been made by several investigators that the quality of reading which a group may do, can be estimated by evaluating the quality of magazine reading material only. It is beyond our purpose here to attempt to justify this assumption, although considerable evidence is available to support it. From the standpoint of feasibility of techniques, it is extremely important that schemes for estimating quality should be independent of the books which are read, since the book titles read from year to year differ widely. Furthermore, the quantity of book reading which is done in lower reading-level groups is quite small. It follows that the possibility of getting representative and adequate samples precludes the possibility of evaluating the reading done by small groups in terms of the books which are read. On the other hand, magazine reading is more prevalent, and although there are new magazines appearing all the time, there is a great deal of continuity from year to year in the titles of the magazines which are read. Moreover, the quality of any one magazine would seem to vary little from year to year, since the purposes and policies of any one magazine tend to remain constant because of the publisher's hope of appealing to some particular public. Likewise, the large number of magazines which are read by all groups tend to give a more satisfactory degree of representativeness and adequacy when applied to groups extremely limited in number. The most prolific magazine-reading groups seldom average over five magazines per person read regularly; and even the lowest reading groups, so far identified, such as adults in certain districts of South Chicago, read regularly almost one magazine per capita. The quantity of reading done by students from the early levels of secondary schools on through to college Seniors seems to vary between two and four magazines per capita, the quantity

appearing to be a fluctuation due more to characteristics of the groups than to grade-levels. The wide popularity of magazine reading, then, makes feasible attempts to evaluate the readings of groups in the light of magazine reading only.

ASSUMING that the quality of all reading done by a group can be noted by the quality of the magazines read by that group, an investigation was attempted to develop a technique for determining the quality of various magazines. The first perplexing problem encountered was a definition of quality. What does one mean when one says, "The quality of *Atlantic* is better than that of *True Story*?" Naturally, some definition of quality had to be stated and adhered to, arbitrary though it might be.

For purposes of the investigation, the quality of a magazine was defined in terms of its readers. Thus, if the *Saturday Evening Post* had a better type of reader than *Collier's*, it was a better magazine, or a higher-quality magazine. The problem of defining what was meant by "better" readers constituted the basic assumptions upon which this investigation was predicated. In this investigation, "better" was defined in three different ways: better in scholastic aptitude, better in English proficiency, and better in knowledge of contemporary affairs. The criteria of quality which were utilized in this study were: First, the quality of one magazine is higher than another if the average reader is higher in scholastic aptitude. Second, the quality of one magazine is higher than another if the average reader ranks higher in English proficiency. Third, the quality of one magazine is higher than another if the average reader shows a greater knowledge of contemporary affairs.

In order to be sure that the fluctuations with respect to any one of these three criteria did not occur as a result of some uncontrolled factor, an attempt was made to test out these criteria only with homogeneous groups. For this purpose, groups of college students were taken. The groups surveyed are shown in Table II. Because of the difference in reading which occurs between sexes, not only were the groups treated separately, but also each group was further subdivided by sex.

The next problem consisted in finding measures which reveal differences in scholastic aptitude, English proficiency, and knowledge of contemporary affairs. Several different

instruments were used for determining scholastic aptitude, depending upon the institution surveyed. These scholastic-aptitude tests are commonly called "intelligence tests," the name differing, depending upon the specific test. For knowledge in contemporary affairs, the Contemporary Affairs Achievement Test, which is published by the Co-operative Test Service and developed by Eurich and others at the University of Minnesota, was used. English proficiency was measured by utilizing the Ohio State University English Placement Test, the purpose of which is to section college students of English into groups according to their ability. All students were asked to state the magazines which they read regularly and those which they read occasionally.

TABLE II

NUMBER OF STUDENTS BY GROUPS

GROUP	UNIVERSITY OR COLLEGE	NUMBER OF STUDENTS		
		Male	Female	Total
(1)	(2)	(3)	(4)	(5)
Granted N.Y.A. aid	University of Minnesota	910	363	1,273
General College 1934, 1935, 1936	University of Minnesota	1,426	802	2,228
5 Liberal-arts colleges	Miscellaneous Midwestern institutions	228	242	470
Incoming Freshmen	Ohio State University	2,199	811	3,010
Total	All	4,763	2,218	6,981

It should be pointed out that there may be a tendency for a student to overstate his magazine reading. In collecting the data, students were advised that no responses which they would make concerning magazine reading would affect their marks. It was hoped that this precaution would have a tendency to remove the temptation to report more or better magazines than those which they actually had read.

Some evidence has been assembled to indicate that this kind of misrepresentation is not a serious factor. Student investigators were placed in fraternity houses, after data had been collected in this manner, for the purpose of finding out whether or not misrepresentation had taken place in filling out the forms used in this study. No evidence was found to indicate that more reading occurred than was reported of those magazines which, it was feared, the students would feel it bad taste to report.

It is also of interest to note that other evidence gathered indicates that when a student reports that he reads a magazine, he does not mean that he has read it from cover to cover. In fact, general practice is much below this volume of reading. Several students have been identified who reported they read the *Saturday Evening Post*, whereas their sole contact with the magazine was a perusal of the advertising material only. A magazine reported "read," probably meant that, on an average, something between fifty and seventy per cent of cover-to-cover reading had been perused. Collected evidence, furthermore, suggests, in general, a student reporting that he reads a magazine regularly means that he reads three-fourths or more of the published issues. These statements may be somewhat difficult to assume and certainly are supported with incomplete evidence in this investigation. However, from the standpoint of determining quality of magazines, they seem to be more or less irrelevant.

IN ORDER to arrive at a quality index for various magazines, it was necessary to assume some base quality. For that purpose, the *Saturday Evening Post* was chosen in this investigation. The choice of this magazine is based somewhat upon the large numbers of readers which it has, no matter in what group reading investigations may be conducted. Furthermore, previous investigators, in referring to the *Saturday Evening Post*, frequently have pointed to it as an "average" magazine.

In each group, separately by sex, the average score on contemporary affairs, the average college-aptitude percentile, and the average English-proficiency score for each of these magazines have been found. Then, in each group, a relative has been computed for each of the magazines by dividing the average for each magazine by the average for the *Saturday Evening Post*. These relatives are shown in Table III. Index numbers of magazine quality shown in the fifth column of Table III were then obtained by computing the unweighted average of the relatives for contemporary affairs, college aptitude, and English proficiency.

A coefficient of correlation of .40 was found between these index numbers of quality and the difficulty ratings developed by Gray and Leary. This indicates quite clearly that they are vastly different. In checking through the discrepancies in rank,

TABLE III

INDEX NUMBERS OF MAGAZINE QUALITY

Saturday Evening Post = 100

NAME OF MAGAZINE	RELATIVE			INDEX NUMBERS	RANK
	Contemporary Affairs	College Aptitude	English Proficiency		
(1)	(2)	(3)	(4)	(5)	(6)
American	96.5	94.2	101.5	97	18
American Home	26.6	88.8	100.0	72	4
American Mercury	226.1	197.3	196.5	207	37
Atlantic	185.9	147.5	144.4	159	33
Collier's	100.5	101.3	96.5	99	19
Cosmopolitan	125.1	127.8	110.7	121	26
Country Gentleman	85.9	56.5	87.9	77	7
Current History	203.5	126.0	197.5	176	34
Delineator	74.9	87.9	99.5	87	9
Esquire	144.2	134.1	108.1	127	27
Fortune	198.4	125.6	115.7	147	31
Forum	169.8	130.0	119.7	140	28
Good Housekeeping	96.5	86.5	101.5	95	15
Harpers	157.8	132.7	137.4	143	29
Ladies Home Journal	83.9	97.7	107.6	96	17
Liberty	75.4	56.5	84.3	72	5
Literary Digest	95.5	76.2	101.0	91	12
McCall's	73.9	95.1	106.1	92	13
Nation	236.2	145.3	242.4	208	38
National Geographic	131.2	125.1	104.0	120	25
New Outlook	168.8	101.3	164.6	145	30
New Republic	319.6	234.1	240.4	265	39
New Yorker	247.7	205.8	120.7	191	35
Pathfinder	100.0	81.2	90.0	90	10
Photoplay	40.2	61.0	94.0	65	3
Pictorial Review	80.9	85.2	105.6	91	11
Popular Mechanics	25.6	73.1	95.5	65	2
Popular Science	35.7	84.3	108.6	76	6
Reader's Digest	126.1	99.6	108.1	111	23
Redbook	105.5	91.0	82.8	93	14
Review of Reviews	116.6	197.8	117.7	111	22
Saturday Evening Post	100.0	100.0	100.0	100	20
Scientific American	74.3	87.0	126.8	96	16
Scribner's	215.1	122.4	128.8	155	32
Time	122.6	86.5	109.1	106	21
Today	341.2	152.5	106.6	200	36
True Story	20.1	17.5	64.1	34	1
Vogue	144.7	108.5	100.0	118	24
Woman's Home Companion	59.8	75.8	94.9	77	8

the most serious ones are noted in respect to *Pathfinder*, *Time*, *Reader's Digest*, and the like. These magazines rating

extremely high in difficulty according to Gray and Leary are reduced to average quality as determined by this investigation.

From a summation of the index numbers of quality, it is possible to find the average reading level of a group. Perhaps it may be necessary to estimate the quality of several magazines for which index numbers of quality are not available providing they appear in sufficient number to justify such an estimate. It will be noted that index numbers are not available for juvenile magazines which were used in limited numbers. All juvenile magazines have been lumped together as a single magazine, and until further investigation produces more accurate index numbers, the quality of these magazines is estimated to be 40. On even less evidence, an index number of 40 is assigned to any adventure or detective-story magazine. With these two additions, index numbers given here may be utilized for estimating levels of reading in secondary schools or in adult groups. Naturally, these additions need not be taken into consideration in determining reading levels of college groups, since juvenile, adventure, and detective stories form such an insignificant part of the pattern of magazine reading. Examples of group reading levels are shown in Table IV. Thus, it will be seen that entering college Freshmen present an average reading level coinciding with the *Saturday Evening Post*, the quality increasing throughout the college period and then decreasing somewhat as adults in the community. The typical high-school reading level is somewhat below *Liberty*; and, in any particular

TABLE IV

GRADE LEVEL AND READING LEVEL

GRADE	GROUP	READING LEVEL	
		Male	Female
(1)	(2)	(3)	(4)
IX	Euclid, Ohio, High School	70.6	83.2
X	Euclid, Ohio, High School	81.2	88.5
XI	Euclid, Ohio, High School	85.1	91.3
XII	Euclid, Ohio, High School	91.8	95.0
Entering Freshmen	Ohio State University	99.9	99.8
Upper classmen	5 Midwest Colleges	121.9	115.9
After graduation	St. Louis professional people	103.5	103.0

[*Continued on page 136*]

Illustrative Test Exercises in High-School Chemistry

By F. P. FRUTCHEY

THAT students forget some learnings in high-school chemistry more rapidly thon others was shown in a recent issue of the BULLETIN.[1] In that study, students were tested as they began high-school chemistry, as they completed high-school chemistry, and one year after completing high-school chemistry. These three times provided a basis for estimating the loss in achievement expressed in percentage of the gain in five objectives of chemistry made during the course. The objectives for which the achievements of the students were tested were a knowledge of facts and principles; a knowledge of chemical terms; a knowledge of symbols, formulas, and valence; balancing chemical equations; and the application of chemical facts and principles.

Evidence of a knowledge of chemical facts and principles is the behavior involved when a student indicates the facts and principles which he selects from a list of facts, principles, and misconceptions about a central topic. In this objective the students retained 84 per cent of their gain during the course. An exercise of this type is as follows:

Directions.—The following exercises consist of incomplete statements, each of which may be completed by one or more of the words or phrases given below the statement. Place a plus sign (+) in the parentheses after those words or phrases which make the statement true.

Ions—

a. Have the same properties as their atoms . . . . . ( )
b. Are electrically charged . . . . . ( )
c. Increase in number as the valence increases . . . . . ( )
d. Are produced by the dissociation of molecules of nonelectrolytes ( )
e. Have properties different from their atoms . . . . . ( )
f. Are produced by the dissociation of molecules of electrolytes . ( )
g. Are produced by the process of electrolysis . . . . . ( )
h. Increase in number as the atomic weight of their atoms increases ( )

Some facts and misconceptions about ions are placed at random in the list. As the student reads the list, he is expected to check each statement which he thinks is true. This type of

[1] Frutchey, F. P. "Retention in High-School Chemistry," EDUCATIONAL RESEARCH BULLETIN, XVI (February 17, 1937), pp. 34–37.

test exercise has been chosen because of experimental evidence which shows a high relationship between students' scores on it and their scores on essay exercises in which the students formulate and write their own answers. In a previous study, high-school chemistry students were given an essay test consisting of questions as, "Name four or more characteristic properties of ions." When the students had completed this test, they were given a second test, consisting of exercises like the one just illustrated.[2] The coefficient of correlation between the scores of the same students on the two tests was .85.[3] Hence, the students who made high scores on the essay test tended to make high scores on the second test. Students who made low scores on the essay test tended to make low scores on the second test. The second test can be used to obtain an index of the behavior required on the essay test.

THE master-list technique was used to get evidence of the students' knowledge of chemical terms. An alphabetical list of 30 chemical terms was prepared. Twenty of these terms were defined or described. The other ten were chosen to include plausible misconceptions for the 20 terms. For example the term *cations* was described and both terms *anions* and *cations* were included in the list. In this objective, the students retained 66 per cent of their gain during the course. Following is an example of this type of test exercise:

Directions.—Below is a numbered list of chemical terms arranged in alphabetical order. Following the list are definitions or descriptions of terms used in chemistry. Read each definition or description, decide what term it is, then place the number of the term in the parentheses after the definition.

1. Amalgam	11. Deliquescent	21. Isomers
2. Amorphous	12. Efflorescent	22. Isotopes
3. Amphoteric	13. Electrolysis	23. Monel metal
4. Anhydride	14. Electrolytes	24. Neutralization
5. Anions	15. Equation	25. Nonelectrolytes
6. Carboxyl	16. Equilibrium	26. Oxidation
7. Catalysts	17. Fire damp	27. Radical
8. Cations	18. Formula	28. Reduction
9. Choke damp	19. Hydrolysis	29. Symbol
10. Dialysis	20. Ions	30. Zymase

[2] Two judges read and graded each essay test. The coefficient of correlation between the scores assigned by the two judges was .97.

[3] Not corrected for attenuation.

a. Positively charged particles of electrolytes in solution . . . . . ( )
b. A double decomposition reaction with water as one reactant . . ( )
c. A characteristic of substances which possess both acid and basic properties . . . . . ( )
d. Elements which appear to be identical in chemical properties but differ in atomic weights and in properties depending upon atomic weights . . . . . ( )

Experimental evidence has shown a high correlation between the type of behavior required on this exercise and that obtained when students write in their own words definitions or descriptions of the terms. In an earlier study, high-school chemistry students were given an essay test in which they were asked to write in their own words definitions or descriptions of a group of chemical terms. When they had completed this test, they were given a test of the master-list type.[4] The coefficient of correlation between the scores on the two tests was .81.

THE third objective was a knowledge of chemical symbolism and valence. Each of the types of exercises used to get evidence of achievement in these objectives involved direct behavior; that is, the students were given chemical symbols and formulas and asked to write the chemical names of each symbol and of each formula. Furthermore, they were provided with the names of chemical compounds and asked to indicate in each case the valence of a given element or radical and whether the valence is positive or negative. Examples of these types of exercises are shown here:

Directions.—Below are symbols for some chemical elements. On the blank line after each symbol, write the name of the element which the symbol represents, as in the sample:
Sample—H . . . . . _____

Directions.—Below are the formulas for certain chemical compounds. On the blank line after each formula, write the chemical name of the compound which the formula represents, as in the sample:
Sample—CO_2 . . . . . _____

Directions.—Below are the names of some chemical compounds. After each name, an element or radical, which is one of the constituents of the compound, is indicated. On the blank line which follows it, write the valence which the element or radical shows in this compound. In each case indicate whether the valence is positive or negative.
Sample—Sodium bromide, the valence of Br is . . . . . ( )

[4] Two judges read and graded each essay test. The coefficient of correlation between the scores assigned by the two judges was .93.

In these three types of behavior taken together, the students retained 70 per cent of their gain during the course.

The balancing of chemical equations was the fourth objective chosen for this study. The test situation consisted of completed but unbalanced chemical equations. The students were expected to balance each equation by substituting for the letters, figures showing the number of molecules of each substance necessary to balance the equation. In this objective, the students retained 72 per cent of their gain during the course. This type of exercise is as follows:

Directions.—Below and in the following columns are some unbalanced chemical equations. In place of the numbers necessary to balance the equations, small letters have been substituted. You are to balance the equation by placing in the parentheses before the letter at the right, the proper number which should be used in place of the letter. The sample shows what you are to do:

Sample—$a\ H_2 + b\ O_2 \rightarrow c\ H_2O$ . . . . . ( )*a*
( )*b*
( )*c*

Note that to balance the equation the figure 2 is needed in place of *a*, the figure 1 in place of *b*, and the figure 2 in place of *c*.

THE behavior involved in the four objectives just illustrated is chiefly the recall of information. The fifth objective also involves the recall of information; it further involves the use of that information in solving a problem. This objective is commonly called the application of facts and principles. Students are presented with a problem situation and asked to predict the probable outcome and to explain or justify their prediction on the basis of known facts and principles. An illustration of an exercise of this type is as follows:

Directions.—In each of the following exercises a problem is given. Below each problem are two lists of statements. The first list contains statements which can be used to answer the problem. Place a plus sign (+) in the parentheses after the statement or statements which *answer the problem.* The second list contains statements which can be used to explain the right answers. Place a plus sign (+) in the parentheses after the statement or statements which *give the reasons for the right answers.* Some of the other statements are true but do not explain the right answers; do not check these. In doing these exercises then, you are to place a plus sign (+) in the parentheses after the statements which *answer the problem* and which *give the reasons for the right answers.*

A water solution of hydrogen chloride is placed in a glass vessel containing two separated electrodes connected with the opposite poles of a storage battery. What will probably happen at each electrode, and why?

a. Hydrogen gas will bubble off the negative electrode ( )
b. Hydrogen gas will bubble off the positive electrode ( )
c. Chlorine gas will bubble off the negative electrode ( )
d. Chlorine gas will bubble off the positive electrode ( )

Check the following statements which give the reasons for the answer or answers you just checked.

e. The chlorine ion picks up an electron at the electrode ( )
f. Hydrogen chloride is separated into hydrogen ions and chlorine ions in water solution ( )
g. Chlorine ions are negatively charged ( )
h. The hydrogen ion picks up an electron at the electrode and forms the hydrogen atom ( )
i. Ions have totally different properties from uncharged atoms ( )
j. Like charges of electricity attract each other ( )
k. Chlorine ions are positively charged ( )
l. The hydrogen ion gives up an electron at the electrode ( )
m. Many compounds may be decomposed by the removal or addition of electricity to their ions ( )
n. Hydrogen ions are positively charged ( )
o. Hydrogen ions are negatively charged ( )
p. Opposite charges of electricity repel each other ( )
q. The chlorine ion gives up an electron at the electrode and forms the chlorine atom ( )
r. Opposite charges of electricity attract each other ( )

Two lists of statements are presented following the problem situation. The first list contains statements of alternative predictions which students may have in mind. The second list contains three kinds of statements—chemical facts and principles which explain the correct prediction, chemical facts and principles which are not relevant to the problem and do not explain the correct predictions, and plausible misconceptions which students hold and which cause them to make wrong predictions. The exercises have been prepared in this way because a high correlation has been found between a test of this sort and an essay test exercise in which the students write in their own words the predictions they would make and the explanation of these predictions.[5] The coefficient of correlation between the

[*Continued on page 140*]

[5] Frutchey, F. P. "Measuring the Ability to Apply Chemical Principles," EDUCATIONAL RESEARCH BULLETIN, XII (December 13, 1933), pp. 255–60.

Certain Attitudes of High-School and College Students

By PAUL R. GRIM

THE development of desirable social attitudes is one of the major objectives of many teachers of the social studies. This objective is considered of special importance by a majority of the social-studies teachers in the Eight-Year Experimental Study of the Progressive Education Association. These teachers have been keenly interested in obtaining evidence concerning the development and modification of the attitudes of their students. The Evaluation Staff of the Eight-Year Study has, in turn, been attempting to aid these teachers appraise significant changes in this behavior of their students. For the past three years these two groups have been co-operating in attempting to measure the attitudes of the students in the Eight-Year Study.

The writer described a phase of this co-operative program of evaluating social attitudes in a previous article. At that time the many difficulties and assumptions involved in the measurement of attitudes were pointed out. An attitude was defined as a belief or feeling which reveals a behavior tendency, and the assumption was made that a verbally expressed opinion would give a valid index of an attitude. The instrument described was called "A Scale of Beliefs," and it was constructed for the purpose of securing evidence concerning the attitudes of students and the consistency of their points of view in certain areas of our national life. The six areas of the test were: militarism, nationalism, racialism, democracy, economic individualism, and labor and unemployment.[1]

The Scale of Beliefs has been given to several hundred students in the thirty schools of the Eight-Year Study and to a large number of other secondary students during the past school year. We have attempted to establish the validity and reliability of the instrument, as well as to revise it rather fundamentally as a result of its use in the schools.

We assumed that our instrument was valid if it gave some evidence in regard to the kind of behavior with which we were

[1] "A Technique for the Measurement of Attitudes in the Social Studies," EDUCATIONAL RESEARCH BULLETIN, XV (April 15, 1936), pp. 95–104.

concerned. The validity of each area was considered separately. Hence, we attempted to gather evidence about this behavior as it was revealed by students who had previously taken the test. Thirty students were interviewed concerning one or more of the areas. Ten students were selected, as a result of our interpretation of the test data, whom we had considered as representing a conservative point of view in each area; ten were selected for their liberal point of view; and the remaining ten were spread between these two extremes. Similar selections of students were made to include the range of consistency of point of view as determined by the scale.

Some of the students were questioned regarding their points of view within a single area; others for two, three, or even all six areas, depending upon their relative positions with respect to the class range for the different areas. In general, we found the scale to be valid for each area. That is, the points of view (attitudes) of the students as revealed by the scale appeared to be closely related to those of their verbally expressed beliefs in regard to the various issues involved. In practically all cases, the statement of the consistency of the students as indicated by the instrument likewise compared favorably with their responses in the interviews. The following case examples should clarify these points:

Elmer's score on the scale was 2.19 for racialism, and he revealed but 2 inconsistencies. Hence, he would be considered to be liberal (in relation to his class) and consistent in his point of view toward race problems. The interview confirmed such a description. He stated positively that he felt that Negroes should be given equal educational, vocational, and social opportunities with members of the white race. He would have them generally "treated the same as whites," while he felt that we may eventually be able to solve our race problems, if we but use intelligence. He stated that he did not dislike playing games or working with Negro boys; he had always found them to be "good sports." He would entertain them in his home, if his parents would allow it, while he felt that they should not be discriminated against in theaters and restaurants. He would draw the line, however, in hotels. With this single exception, he seemed to be quite consistent in his liberal point of view toward racialism.

Jack's score for racialism was 3.25, and he revealed 11 inconsistencies on the test. Therefore, we would expect him to be relatively conservative and inconsistent. The interview adequately confirmed such an interpretation. He stated that he would grant the Negro equal educa-

tional opportunities, but would deny him equality in vocational and social matters. He felt that we would never be able to solve our race problem, saying it was "hopeless." He revealed a high degree of inconsistency toward specific aspects of the problem. He did not like to play with Negroes, saying that they were poor sports who "couldn't take it." He would eat with them in the school cafeteria, but not in a public restaurant. He "guessed that it was O.K. for Negroes to go to our theaters, providing they sat in the balcony." He would segregate them to their own hotels.

Joe's score for militarism was the lowest in the class: 1.95. He revealed only 3 inconsistencies. We, therefore, would expect him to be liberal and consistent in this area—being generally opposed to war. During the interview his behavior verified such a description. He felt that we may be able to abolish all wars in the future; he did not favor the maintenance of a large standing army for our country. War, he believed, was almost never necessary; compulsory arbitration should be substituted as a means of settling international disputes. He would fight for his country only in actual defense of our national boundaries; he would not fight if we attacked another nation. He did not favor the R.O.T.C. in universities. He concluded by saying that wars really accomplish no good, but injure all participants.

Mary's score for democracy was 2.12, and she revealed but 4 inconsistencies. This seemed to indicate that she was rather liberal and fairly consistent with respect to the problems and issues of this area. During the interview she indicated that democracy was a very desirable form of government, and that we had a fairly democratic government in America. She believed that all citizens should have freedom of speech —including Communists and Socialists. She trusted the intelligence of the common man, for "that is what democracy really means." She believed that many people are denied opportunity for maximum happiness because of the inequalities of our economic order, and also that our national government is influenced too much by selfish industrial groups. Finally, she stated that the Constitution should be amended to meet the needs of modern society.

THE questions asked in these interviews paralleled the items of the scale. The information obtained in this way was then compared with the test results, and uniformly it was found to be consistent. The validity of the test, for the purposes involved in our interpretation of the results as based upon a study of 30 students, is therefore apparently high.

The reliability of the scale was determined by the split-half method. Coefficients of correlation were found for the points of view and consistency of each of the six areas independently.

Most of these correlations were above .90; the lowest was .827 (for nationalism) and the highest was .95 (for labor and unemployment).

Test results for approximately one thousand students are summarized in the tables. These data present a rather clear picture of the attitudes, consistency, and uncertainty of these high-school and college students within the areas of the scale.

The uppermost section of Table I presents the average

TABLE I

POINTS OF VIEW, CONSISTENCY OF POINTS OF VIEW, AND CERTAINTY OF POINTS OF VIEW OF HIGH-SCHOOL AND COLLEGE STUDENTS

Grade	Number of Students	Areas Arranged in Decreasing Order					
		Points of View					
		Liberalism ..... Conservatism					
IX	54	Militarism (1)	Nationalism (2)	Democracy (3)	Labor and unemployment (4)	Economic individualism (5)	Racialism (6)
X	264	Racialism (1)	Militarism (2)	Nationalism (3)	Democracy (4)	Economic individualism (5)	Labor and unemployment (6)
XI	158	Militarism (1)	Racialism (2)	Nationalism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)
XII	282	Militarism (1)	Racialism (2)	Nationalism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)
College students	247	Militarism (1)	Nationalism (2)	Racialism (3)	Democracy (4)	Economic individualism (5)	Labor and unemployment (6)
		Consistency of Points of View					
		Consistency ..... Inconsistency					
IX	54	Racialism (1)	Nationalism (2)	Militarism (3)	Democracy (4)	Economic individualism (5)	Labor and unemployment (6)
X	264	Racialism (1)	Militarism (2)	Nationalism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)
XI	158	Racialism (1)	Nationalism (2)	Militarism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)

TABLE I [*Continued*]

Grade	Number of Students	Areas Arranged in Decreasing Order					
		Consistency of Points of View					
		Consistency ..... Inconsistency					
XII	282	Racialism (1)	Nationalism (2)	Militarism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)
College students	247	Racialism (1)	Nationalism (2)	Militarism (3)	Democracy (4)	Economic individualism (5)	Labor and unemployment (6)
		Certainty of Points of View					
		Certainty ..... Uncertainty					
IX	54	Racialism (1)	Militarism (2)	Nationalism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)
X	264	Militarism (1)	Racialism (2)	Democracy (3)	Nationalism (4)	Labor and unemployment (5)	Economic individualism (6)
XI	158	Democracy (1)	Militarism (2)	Racialism (3)	Nationalism (4)	Labor and unemployment (5)	Economic individualism (6)
XII	282	Racialism (1)	Militarism (2)	Nationalism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)
College students	247	Racialism (1)	Militarism (2)	Nationalism (3)	Democracy (4)	Labor and unemployment (5)	Economic individualism (6)

points of view of the high-school and college students in order of their decreasing liberalism by area. That is, the six areas are arranged from the one in which the students are most liberal to the one in which they appear to be most conservative. In Grade IX the students were most liberal in the area of militarism. They were slightly less liberal in nationalism and democracy, while they became more conservative in the three areas of labor and unemployment, economic individualism, and racialism, respectively. In Grade X the students were most liberal in racialism, which area had ranked most conservative for Grade IX. Militarism, nationalism, democracy, economic individualism, and labor and unemployment followed in order, with the

last named area being the most conservative. The students in Grades XI and XII were most liberal in the area of militarism and most conservative in the area of economic individualism. Racialism, nationalism, democracy, and labor and unemployment rank second, third, fourth, and fifth, respectively, for both of these grades. The college students, who were Juniors and Seniors, had points of view quite similar to those of Grades XI and XII already listed. They were most liberal in militarism, with nationalism and racialism next in order. Democracy ranked fourth, followed by economic individualism. These college students were apparently most conservative in the area of labor and unemployment.

TABLE II

COMPARISON OF THE HIGH-SCHOOL AND COLLEGE STUDENTS IN LIBERALISM AND CONSISTENCY

Area	More Liberal	More Consistent
(1)	(2)	(3)
Militarism	High school	High school
Racialism	Same	Same
Nationalism	High school	Same
Democracy	Same	High school
Labor and unemployment	Same	High school
Economic individualism	College	High school

We may briefly summarize these data concerning the attitudes of these high-school and college students by pointing out that the areas seem to fall into two groups. In general, the students were most liberal in the areas of militarism, racialism, and nationalism, and most conservative in democracy, economic individualism, and labor and unemployment, respectively. There was but a single exception to the first generalization: democracy ranked third and racialism sixth for Grade IX. In the second group, the students were least conservative in the area of democracy, and equally divided by grades between economic individualism and labor and unemployment as the most conservative.

The middle section of Table I gives the consistency of the points of view of the students in the six areas of national life.[2] Each grade was most consistent in racialism, with nationalism

[2] "Consistency" of point of view as used in this study means the degree to which the student is able to maintain the same relative position in his beliefs about the various issues involved in the different areas of the scale. To be highly consistent, therefore, most of his answers must be either liberal or conservative. See the article referred to in Footnote 1.

second in this respect and militarism third. In Grade X, the students were apparently more consistent in militarism than in nationalism; this case was the only exception to the order as given. The students of each grade were most inconsistent in the areas of democracy, economic individualism, and labor and unemployment. Of these three areas, the students were less inconsistent in democracy, and most inconsistent in economic individualism. Grade IX and the college students, however, were most inconsistent in the area of labor and unemployment.

It should be noted that the three areas in which the students were most inconsistent were likewise the same areas in which they were most conservative, that is, democracy, labor and unemployment, and economic individualism (*see* the middle section of Table I). And conversely, they were most consistent in the areas in which they were most liberal. No great significance should be attached to this fact, however, until many more data are secured. There may be no causal factor operative, but it seems logical to assume that the problems of militarism, racialism, and nationalism are explored and discussed more freely and frequently than the problems of the former three areas. Therefore, one expects greater consistency within these areas.

The lowest section of Table I indicates the degree of certainty of the students in regard to the problems of the different areas of the test.[3] In general, the classification made in terms of consistency is also valid here. That is, the students are most certain within the areas of militarism, nationalism, and racialism, and most uncertain in democracy, labor and unemployment, and economic individualism. Within these two classifications we note the students are most certain in their attitudes toward racialism, with the exceptions of Grades X and XI, and most uncertain in economic individualism. These facts seem to support our previous assumption that the students—especially in the secondary schools—have not explored the problems involved in the latter three areas as adequately as those in the former three. It is also interesting to note that the certainty of the college students by area is identical to that of Grades IX and XII of the high-school students.

Table II presents a comparison of the liberalism and con-

[*Continued on page 140*]

[3] "Certainty" means that the student is positive in his point of view within the different areas. "Uncertainty" means that the student was unable to state his belief concerning some of the issues, and indicated that on the test.

EDITORIAL COMMENT

Radio

Two promising developments of the use of radio in the schools were strikingly apparent in the discussions of the Institute on Education by Radio which has just completed its session at Columbus. The first of these is the use of electrical transcriptions. This is important because the chief difficulty of the schools in using radio is to synchronize radio offerings with the daily time schedules of the schools and with the annual curriculum calendar. The radio broadcast is inflexible in point of time. It is offered exactly on the minute and closes in similarly precise fashion.

In the more flexible time program of the elementary school the teacher can accommodate broadcasts rather easily, but in the high school with its fixed class periods this flexibility is absent. If the French broadcast is set for ten o'clock in the morning and the school period in French is from ten-fifteen to eleven, there is no way by which the broadcast can be efficiently used without changing the whole time schedule of the high school, and this is not ordinarily practical. Educational stations have tried to meet the situation by obtaining as many data as possible about time schedules. But these are so varied that in the end stations have decided that one period for offering a broadcast is about as good and no better than another. Consequently, the station announces its time, and those schools whose periods synchronize with the offering may use it if they wish. For other schools the broadcast is not usable.

To make matters more complicated the curriculum programs of the schools lack sufficient uniformity to permit the most effective synchronization of broadcasts with the curriculum topics of the schools. If the broadcast on the geography of Canada for the intermediate grades is presented in March according to its schedule, a class may have studied Canada in November in which case the broadcast is too late, or it may work upon Canada in May, in which case the offering is too early. Again, educational stations attempting to find the time of the year at which topics will be covered most commonly in the schools of the region, discover no central tendencies because

schools and teachers largely settle such matters in the light of local conditions.

This inflexibility of the schools, on the one hand, and of the broadcast, on the other, will largely disappear as a disturbing factor when electrical recordings become widely used. Just recently technical improvements have been developed, and we are now in a position where satisfactory recordings can be made and stations can soon provide schools with records of outstanding broadcasts at a reasonable price. The schools are thus in a position to build libraries containing permanent records which the teacher may use at exactly the time when he needs them. Maximum flexibility is thus achieved at a modest expense, and the quality of the recorded broadcast is for practical teaching purposes just about as good as the reception on the airways. Within the next year or so we may look for rapid expansion of the preparation of educational records by broadcasting stations.

A SECOND trend discussed at the Institute, which has intriguing possibilities, is the use of ultra–short-wave transmission by city and county school systems. The special advantage of the ultra–short-wave is that it carries only over a radius of twenty-five miles and is not heard through the ordinary receiver. Because of the narrow area covered, each school system can have a self-contained service of its own. Cleveland, for instance, is about to install such a system and expects to broadcast lessons, supervisory announcements, and the like to all its schools. It will not have to consider the interests of the commercial stations or adult audiences, as it has had to do when using the local stations. No one will hear the broadcasts except the schoolrooms equipped with the appropriate receivers. And, interestingly enough, Akron and Toledo can use the same wave band at the same time because of the twenty-five–mile coverage. In fact, Ohio could be covered by about twenty-five such stations all on the same band.

This development is in its late experimental stages, and evidence is available to show that the plan is practicable for all large cities and many counties. The cost seems to be quite within the range of many such school units.

Radio is rapidly settling into its place as an educational medium. Ten years ago extravagant claims were made for it —all subjects could be taught by radio—the master artist at the

microphone would supplant the classroom teacher. We are now discovering where and when the radio can be best used, and where and when it will not work. Particularly we are discovering new uses which were not thought of ten years ago. Electrical records and ultra–short-wave stations are two examples.

W.W.C.

Dean Arps

With the transfer of Dean George F. Arps from the deanship of the College of Education to the direction of the Graduate School, the staff of the BULLETIN takes this opportunity to express its gratitude for his consistent support of its activities. He aided Mr. Buckingham in the establishment of the BULLETIN; he found money for its support for several years; he advised the staff on its policies; and supported the magazine at critical periods. As dean of the Graduate School of Ohio State University his interest in the EDUCATIONAL RESEARCH BULLETIN as a journal of research will continue with friendly vigor.

* * *

Determining Levels of Group Reading

[*Continued from page 121*]

grade, the reading level of the girls is somewhat higher than that of the boys. Fortunately, this is not out of line with the best thought in the field of psychology, namely, that girls mature somewhat earlier than do boys.

It is interesting to note the degree of agreement with which different people will estimate the reading level of a group, even though a fair proportion of the reading consists of magazines other than the thirty-nine for which index numbers of quality are available. Utilization of index numbers of magazine quality yields evidence concerning the level of reading in a group which should be found useful in the evaluating of any instruction which has as its objective the improvement of student reading level. Index numbers of quality for other magazines than the thirty-nine most popular with college students at the time of this investigation may make more sensitive the evaluation of levels of group reading.

READINGS

Books to Read

GRAVES, FRANK PIERREPONT. *A Student's History of Education: Our Education Today in the Light of Its Development.* New York: Macmillan Company, 1936. xix+567 pp.

This is a revision of the author's *A Student's History of Education*, which was published in 1915 and enjoyed wide popularity. While it follows in general the original plan, it has been largely re-written, brought up to date, and enlarged about twenty-five per cent.

Since the book is intended to be primarily a textbook for those intending to become teachers in the United States, the author has emphasized developments during the last three centuries, especially in this country, and greatly condensed his treatment of ancient, medieval, and early modern times. This permits a fuller treatment of American education than might be expected in a book of this size, which deals with elementary, secondary, and higher education, and covers developments from "The Earliest Education" to the present.

Even so, the treatment, even of American education, is necessarily highly condensed. Condensation in historical writing can be obtained by reducing either the number of topics treated or the amount of treatment given to each. The author in the present case leans toward the latter method. This results in a good many passages that are too general to be very interesting or informative, or too categorical to be accurate.

Hence it seems to the reviewer (and, no doubt, to the author also) that students using this book should do a considerable amount of carefully selected supplementary reading. Excellent lists of readings are given at the ends of the various chapters. Used in this way, the book should serve a very useful purpose.

R. H. ECKELBERRY

DUNLAP, KNIGHT. *Elements of Psychology.* St. Louis, Missouri: C. V. Mosby Publishing Company, 1936. 499 pp.

This volume is a revision of the author's *Elements in Scientific Psychology*, published in 1922. The major change from the earlier edition of interest to students of education lies in the elaboration of the principles of learning. There is nothing added to these principles in this book that has not previously appeared in the author's *Habits: Their Making and Unmaking* (1928). The section on perception is masterly. The chapter on "Thought and Thinking" digests some material that is not treated widely in educational psychology, an oversight which somebody should remedy in the near future.

The book is intended as a beginning textbook in psychology, but it will not be widely used for beginners for at least two reasons: First, the vocabulary load is excessive. Second, the material is not tied to the facts of everyday experience. There is implicit in the treatment the notion that mastery of definition and vocabulary ensures the kind of understanding that makes the practical application of these principles an automatic process. Except for a few

sections, it would be extremely difficult even to plan experimental demonstrations that would appear to have any connection with text material. References to everyday life are even more remote. As a presentation of Dunlap's systematic position, the book will be valuable to graduate students in psychology.

W. L. VALENTINE

COSTIELLO, JAIME. *A Humane Psychology of Education.* New York: Sheed and Ward, 1936. xxiii+254 pp.

The author has directed a suavely written and well-documented polemic against the "naturalistic" psychologies of Thorndike, Dewey, Yerkes, *et al.* Part I, "The Raw Stuff of Personality," deals with the nature of thought, creative power, the making of the self, and the educational implications thereof. Part II, "The Molds of Personality," sets forth a faculty psychology of the major areas of subject-matter. Part III describes Christ as the ideal personality, and outlines an educational theory in the light of that ideal.

The author limits himself to quotations of a theoretical nature from other psychologists in an attempt to synthesize some of the aspects of contemporary systematic psychology with a tradition of "humanism" which is at once "dualistic in its philosophy," "harmonic in its form," and "idealistic in its appeal." The reader is referred in the Appendix to other sources for the experimental evidence which the author deduces to support his contentions. Since this essay is a Roman Catholic treatment of man "as a unity in multiplicity," many readers will be sorry that there is no exposition of the dynamic psychology of Dom Thomas Moore and social psychology of P. H. Furfey.

While the author has a pleasing style and an imposing array of historical citations, the book is obviously not an educational psychology in the usual manner of presenting a discussion of experimental data.

J. E. JANNEY

DRAPER, EDGAR MARION. *Principles and Techniques of Curriculum Making.* New York: D. Appleton-Century Company, 1936. xv+875 pp.

Like the recent Caswell and Campbell book entitled *Curriculum Development* this treatise is constructed in the concrete, practical schoolroom situation and therefore has valuable suggestions for the teacher committees at work on the curriculum. Its 875 pages and three hundred thousand words are packed with a wealth of specific suggestions and illustrations of material worked out in practice. Bibliographies are generously supplied and interestingly annotated. The organization is encylopedic rather than unified.

W. W. CHARTERS

UMSTATTD, J. G. *Secondary School Teaching.* New York: Ginn and Company, 1937. x+459 pp.

This volume represents to the reviewer a creditable effort to produce a good textbook for use in schools of education. There are four divisions, as follows: pre-instructional problems, five chapters dealing with objectives and other prior general considerations; procedure involving the unit idea, four chapters in which the evolution of the unit idea is traced and its application elaborated; additional classroom procedures, six chapters devoted to planning, special instructional aids including motion pictures and radio, and measurement; and associated activities of the teacher, two chapters on activities and professional improvement beyond the limits of instruction.

In its comprehensiveness the book is outstanding. The presentation is commendable also for its lucidity in view of the condensation found necessary in dealing with so extensive an amount of material. Success in completeness, however, has been attained at more serious cost as regards exemplification of the unit idea, which the author attempts, since it means inevitable sacrifice of vividness of impression. Still more deplorable to the reviewer is his inability to expect that less experienced readers of the book will get that stirring kind of realization of the extraordinary educational challenge of the times which is so much to be desired.

F. C. LANDSITTEL

GOOD, CARTER V., AND HENDRICKSON, GORDON, Editors. *Abstracts, Graduate Theses in Education, Teachers College, University of Cincinnati, 1931–1936, Vol. II.* Cincinnati, Ohio: Teachers College, University of Cincinnati, May, 1936. xix+249 pp.

In addition to listing the doctoral dissertations and Masters' theses written during the years 1931–1936, this book contains rather extended summarizations of Doctors' dissertations for these years. Six of these are distinctly in the field of psychology: Forrest D. Brown, "An Experimental Analysis of the Alleged Criteria of Insight Learning"; John Alfred Broxson, "The Determination of a Course in Psychology for the High School"; W. H. Burton, "The Measurement of the Social-Civic Intelligence of High School Students"; Inez Beverly Prosser, "Non-Academic Development of Negro Children in Mixed and Segregated Schools"; Wilder Rosbert Reynolds, "Effect of Tobacco Smoke on the Growth and Learning Behavior of the Albino Rat and Its Progeny"; and L. May Wilmoth, "Configurational and Trial and Error Learning—A Comparison." Two are historical: Francis J. Bredestege, "The Educational Philosophy of Antonio Rosmini-Serbati"; and Albert Mock, "The Private Academy Movement in Indiana from 1850 to 1900." Two deal with instructional procedures: Samuel Engle Burr, "A Study of a Transitional Period in a Public School"; and Louisa Amelia Van Dyke, "An Analysis of the Elementary Course in Statistics with Implications for Revision and Improvement." Two deal with public-school administrative practice: Peter J. Iverson, "Equalization of Educational Support in North Dakota"; and Harry Fox Young, "Sabbatical Leave for Public-School Teachers in the United States." One treats an aspect of higher educational administration: Harry F. Toothman, "The Academic Dean of the Liberal-Arts College."

Although descriptions are sufficiently detailed in most cases to give a fairly accurate idea of the methods of investigation used, there is a rather general failure, so far as the abstracts are concerned, to relate the specific subject of the treatment to the area to which it pertains and to indicate the significance of the study. In no case are the techniques or findings of any of these dissertations of a character to make it a noteworthy contribution in its field although several of the studies are undoubtedly of considerable value. The publication of the extended abstracts is a worth-while enterprise.

ARTHUR J. KLEIN

Tests in High-School Chemistry

[*Continued from page 126*]

scores of the same students on the two types of tests was .82.[6] In this objective the students retained 92 per cent of their gain during the course.

The foregoing is a brief description of the kinds of behavior representing five objectives chosen for the study of retention in high-school chemistry. Further studies should include other objectives as the interpretation of experimental data, formulating plans for testing hypotheses, recognizing unstated assumptions and the attitudes related to chemistry teaching.

[Vol. XVI, No. 5]

Certain Attitudes of Students

[*Continued from page 133*]

sistency of the high-school and college students within the six areas. The high-school students were more liberal in the areas of militarism and nationalism; the college students were more liberal in economic individualism; the two groups held approximately the same points of view in democracy and labor and unemployment. The secondary students were more consistent in the areas of militarism, democracy, labor and unemployment, and economic individualism. The two groups were equally consistent in racialism and nationalism. The college students were not the more consistent in any one area.

In the four areas in which the high-school students were more consistent than the college students, the difference was rather great. That is, the college students were considerably more inconsistent within these areas than the high-school students. Since the Scale of Beliefs was constructed for use with high-school students, however, these differences in consistency may not be valid. The college student, for example, may have inquired deeply into the meaning of the different test items, analyzed them carefully, and subjectively justified his seemingly inconsistent position by known facts. These data, nevertheless, seem to raise interesting questions concerning the comparative objectives, curriculums, and methods of the social studies in secondary and higher education which may well challenge teachers on both levels.

[Vol. XVI, No. 5]

[6] Not corrected for attenuation.

Teacher-Recommendation Service

ADMINISTRATORS looking for able teachers are getting much help from the Appointments Division, the Bureau of Educational Research, Ohio State University. In this office are registered the credentials of more than five thousand teachers, mostly experienced, but including more than four hundred graduating from teacher-training courses in 1937. In addition there are many with Masters' or Doctors' degrees.

All graduates from the College of Education since 1928 are registered with the Appointments Division. Their records are available to any administrator who is considering one of them as a teacher.

The large number of teachers enrolled makes it possible for the Appointments Division to find well-trained people for a wide range of demands. Requests for assistance will be answered promptly, carefully, and candidly by Earl W. Anderson or Mary A. Ewan, Appointments Office, Ohio State University.